

**REMARKS**

Please reconsider the application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering this application.

**Disposition of the Claims**

Claims 34-38 and 45-50 are pending in this application. Claims 34 and 45 are independent. The remaining claims depend, directly or indirectly, from claims 34 and 45.

**Amendments to the Claims**

Claims 34 and 45 have been amended to clarify the invention recited. In particular, the phrase "graphically displaying" has been deleted in both claims 34 and 45. Claims 34 and 45 have been amended to recite "outputting a volume cut by each of the roller cones." No new matter has been added by way of this amendment, as support for this amendment may be found in, for example, paragraphs [0040] and [0048], as discussed below.

Independent claims 34 and 45, as amended, recite *inter alia* outputting the volume cut by each of the roller cones. Applicants note that the outputting of the volume cut by each of the roller cones may include a visual representation of the hole being drilled. In one embodiment, the visual representation of the hole being drilled in an earth formation where crater sections calculated as being removed during drilling are visually "removed" from the bottom surface of the hole. Alternatively, the visual representation may include graphs of any of the parameters provided as input, or any or all of the parameters calculated in order to generate the visual representation. (See paragraph [0040].) The means used for visually displaying aspects of simulated drilling is a matter of convenience for the system designer. Thus, one of ordinary skill in the art will appreciate that the form or design of the outputting may vary

without departing from the scope of embodiments described. Examples of such outputs or visual representations are shown in, for example, figures 7, 8A, and 8B.

The outputting of the volume cut is further described with reference to Figures 8A and 8B. The cutting element is then removed, leaving behind a crater in the earth formation sample having an interference depth  $b$ , for example as shown in FIG. 8A. The resulting crater is then converted to coordinates describing the geometry of the crater. In this example embodiment, the crater is optically scanned to determine the volume and surface area of the crater. Then the shape of the crater is approximated by representing the more shallow section of the crater, resulting mostly from fracture, as a cone, and representing the deeper section of the crater, generally corresponding to the shape of the tip of the cutting element, as an ellipsoid, as shown, as shown, for example, in FIG. 8B. (*See* paragraph [0048].)

### **Objections**

The drawings stand objected to under 37 CFR § 1.83(a), as failing to show every feature of the invention specified in the claims. In particular, the Examiner asserts that none of the drawings (Figures 1-17) appear to explicitly show the amended elements relating to “graphically displaying the formation with the volume cut by each of the roller cones,” as claimed in independent claims 34 and 45. Claims 34 and 45 have been amended in reply to clarify the present invention recited. In particular, the phrase “graphically displaying” has been deleted from claims 34 and 45. Thus, this objection is now moot. Accordingly, withdrawal of this objection is respectfully requested.

**Rejections under 35 U.S.C. § 112**

Claims 34-38 and 45-50 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention. Claims 34 and 45 have been amended in this reply to clarify the present invention recited. In particular, the phrase "graphically displaying" has been deleted from claims 34 and 45. Thus, this rejection is now moot. Accordingly, withdrawal of the rejection is respectfully requested.

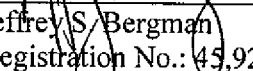
**Conclusion**

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 05516/056003).

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Respectfully submitted,

By

  
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Attachments